

WHAT IS CLAIMED IS:

1. A tape carrier package semiconductor device, which has a tape carrier and semiconductor elements that have been packaged on the tape carrier, characterized in that said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on the metal-wiring-pattern side, and

a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm² to 70 kgf/mm².

2. The tape carrier package semiconductor device as defined in claim 1, wherein the solder resist forming the first and second insulating protective films has a thickness in the range of 5 μ m to 45 μ m.

09161478.092898
A

3. The tape carrier package semiconductor device as defined in claim 1, wherein the solder resist of the first insulating protective film contains a filler that determines the viscosity thereof in the range of 10 wt% to 40 wt%.

4. The tape carrier package semiconductor device as defined in claim 1, wherein the solder resist forming the first and second insulating protective films is made of any of rubber, polyimide, epoxy, silicon and urethane solder resists.

5. The tape carrier package semiconductor device as defined in claim 1, wherein the periphery of portions at which the tape carrier and the driving semiconductor elements have been electrically connected is covered with liquid resin having an insulating property in a manner so as to allow the edge of the liquid resin to make an angle of not more than 70° with the upper surface of the first insulating protective film.

6. The tape carrier package semiconductor device as defined in claim 1, wherein the first and second insulating films are made of the same material.

7. The tape carrier package semiconductor device as

09161478.092898

defined in claim 6, wherein the solder resist forming the first and second insulating protective films has a thickness in the range of 5 μm to 45 μm .

8. The tape carrier package semiconductor device as defined in claim 6, wherein the solder resist of the first and second insulating protective films contains a filler that determines the viscosity thereof in the range of 10 wt% to 40 wt%.

9. The tape carrier package semiconductor device as defined in claim 6, wherein the solder resist forming the first and second insulating protective films is made of any of rubber, polyimide, epoxy, silicon and urethane solder resists.

10. A liquid crystal panel display, which is provided with a liquid crystal panel and a tape carrier package semiconductor device having a tape carrier and semiconductor elements that have been packaged on the tape carrier so as to drive the liquid crystal panel, characterized in that said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape,

09161478.092898

Del
A2

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on the metal-wiring-pattern side, and

a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm² to 70 kgf/mm².

11. The liquid crystal panel display as defined in claim 10, wherein the solder resist forming the first and second insulating protective films has a thickness in the range of 5 μ m to 45 μ m.

12. The liquid crystal panel display as defined in claim 10, wherein the solder resist of the first insulating protective film contains a filler that determines the viscosity thereof in the range of 10 wt% to 40 wt%.

13. The liquid crystal panel display as defined in claim 10, wherein the solder resist forming the first and

09161473-092898

second insulating protective films is made of any of rubber, polyimide, epoxy, silicon and urethane solder resists.

14. The liquid crystal panel display as defined in claim 10, wherein the periphery of portions at which the tape carrier and the driving semiconductor elements have been electrically connected is covered with liquid resin having an insulating property in a manner so as to allow the edge of the liquid resin to make an angle of not more than 70° with the upper surface of the first insulating protective film.

15. The liquid crystal panel display as defined in claim 10, wherein the first and second insulating films are made of the same material.

16. The liquid crystal panel display as defined in claim 15, wherein the solder resist forming the first and second insulating protective films has a thickness in the range of 5 μm to 45 μm .

17. The liquid crystal panel display as defined in claim 15, wherein the solder resist of the first and second insulating protective films contains a filler that determines the viscosity thereof in the range of 10 wt% to

09164478.092898

40 ~~wt%~~.

18. The liquid crystal panel display as defined in claim 15, wherein the solder resist forming the first and second insulating protective films is made of any of rubber, polyimide, epoxy, silicon and urethane solder resists.

19. The liquid crystal panel display as defined in claim 10, wherein the liquid crystal panel has a size of not less than 10 inches.

20. A testing method for disconnection, which is a testing method for disconnection in a tape carrier which constitutes a tape carrier package semiconductor device and in which a metal wiring pattern and an insulating protective film for insulating and coating the metal wiring pattern are placed on an insulating tape, comprising the steps of:

manufacturing a testing tape carrier having a construction identical to the tape carrier;

connecting both of the ends of the testing tape carrier to plate-shaped substrates;

aligning the substrates face to face with each other so that the testing tape carrier is brought into a bent state; and

exposing the testing tape carrier to temperature

09161478-092888

environments which change with a predetermined cycle so as to count the number of cycles until the metal wiring pattern in the testing tape carrier has been subjected to disconnection.

21. The testing method for disconnection as defined in claim 20, wherein the testing tape carrier has one end connected to the liquid crystal panel with the other end being connected to a circuit board for outputting a signal for driving the liquid crystal panel.

22. The testing method for disconnection as defined in claim 21, wherein the testing tape carrier is exposed to temperature environments which change with a cycle of 30 minutes between 85°C and - 30° and if the metal wiring pattern of the testing tape carrier is immune from disconnection up to 200 cycles, it is regarded to be highly resistant to disconnection.

add c5 >

09161478-092898